Nutrient Criteria Rulemaking for Indiana's Lakes

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IDEM External Workgroup Meeting
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University Lake , near Bloomington
Source: Indiana Clean Lakes Program, 2009

Outline

- Why Develop Nutrient Criteria?
- Statutory and Regulatory Requirements
- Adverse Impacts of Nutrient Pollution
- Blue Green Algae in Indiana Lakes
- Effects of Algal Blooms
- Sources Contributing to Nutrient Pollution
- Indiana's Narrative Criteria
- Current Phosphorus Removal Requirements
- Nutrient Impairments in Indiana Lakes
- Proposed Rulemaking
- Definition of Naural Lakes and Reservoirs
- Future Topics

Why Develop Nutrient Criteria?

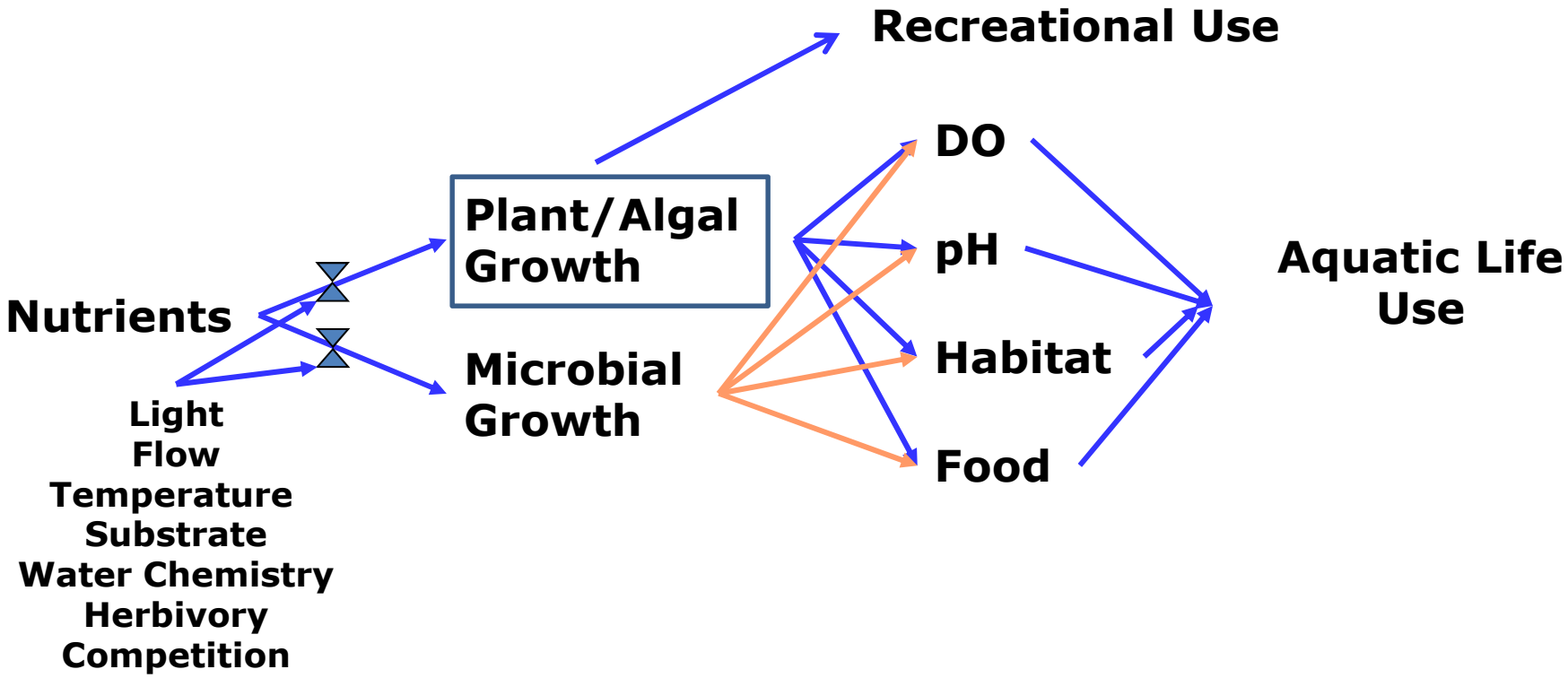
- USEPA committed to developing nutrient criteria in the 1998 Clean Water Action Plan
- Protect waters from harmful nutrient impacts
- Necessary to support 303(d) listing decisions, development of Total Maximum Daily Loads (TMDLs), and determination of permit limits
- IDEM's Environmental Performance Partnership Agreement (EnPPA) with EPA

AND…..

Statutory and Regulatory Requirements

- **From CWA:**
  - Section 101 – Broad expectations and authorities of states and EPA regarding water quality protection
  - Section 303 – Broad expectations and authorities of states and EPA regarding water quality standards (WQS) and implementation
- **From 40 CFR 131 (WQS regulation):**
  - 131.11(a)(1) – "…must adopt those water quality criteria that protect the designated use" AND "…criteria must be based on a sound scientific rationale and must contain sufficient parameters and constituents to protect the designated use".
  - 131.11(b)(1) – Criteria. "In establishing criteria, States should…establish numerical values…"

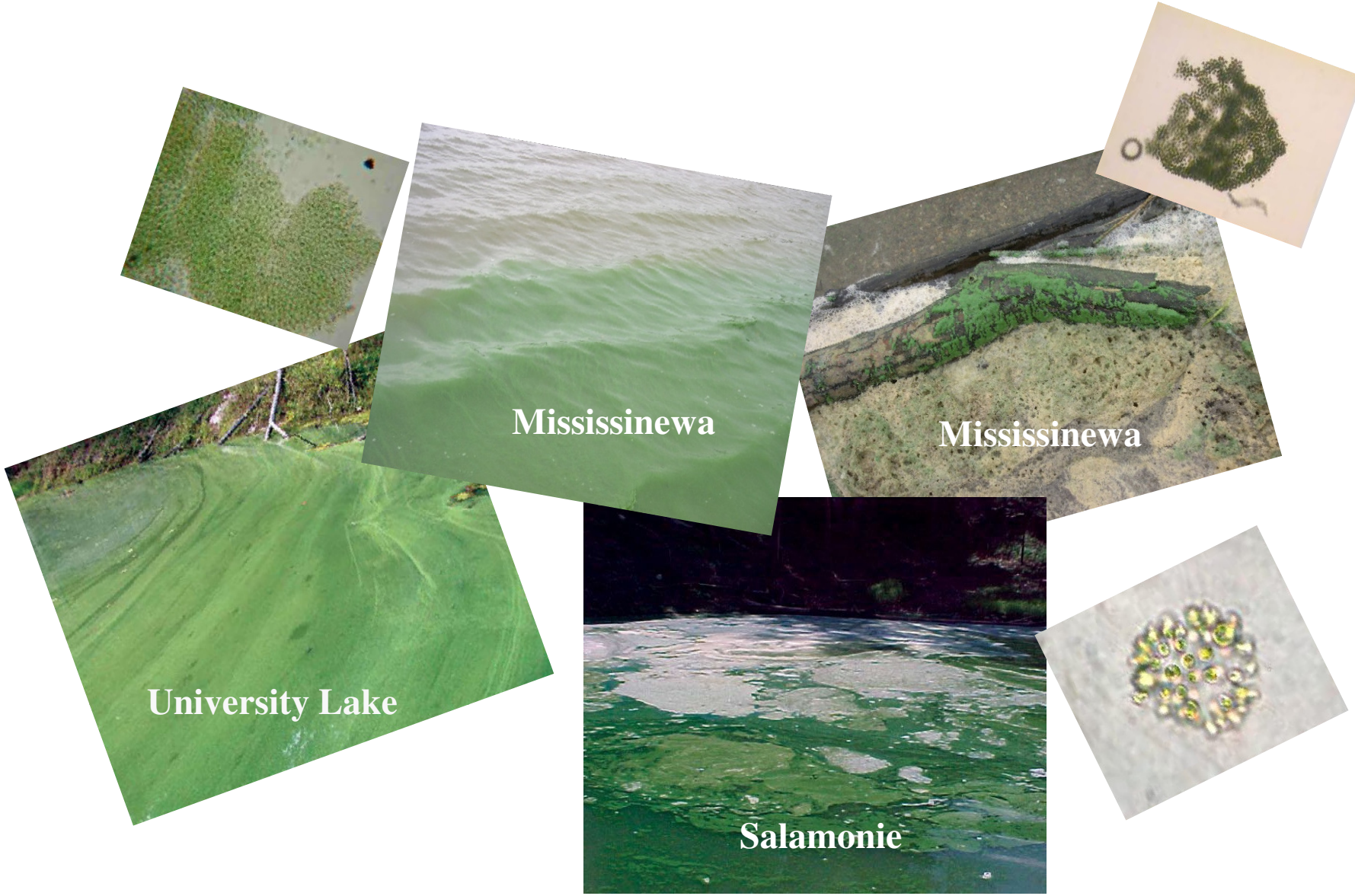
Adverse Impacts of Nutrient Pollution



Effects of Algal Blooms

- Increased turbidity
  - Impair ability of fish and other aquatic life to find food
- Damage or clog gills of fish and other invertebrates
- Harmful algal blooms (HABs) can form toxins that cause illness/death in some animals
- Impacts on human health
  - Direct: through drinking water contaminated with HAB toxins or consuming toxic shellfish
  - Indirect: restrictions on recreation

Blue Green Algae in Indiana Lakes



Sources Contributing to Nutrient Pollution

- Municipal and industrial waste water discharge
- Row crop agriculture
- Animal husbandry
- Sources associated with land use and development
- Atmospheric deposition

Indiana's Narrative Criteria

- "All surface waters at all times and at all places, including waters within the mixing zone, shall meet the minimum conditions of being free from substances, materials, floating debris, oil, or scum attributable to municipal, industrial, agricultural, and other land use practices, or other discharges that do any of the following:

  (A) Will settle to form putrescent or otherwise objectionable deposits.

  (B) Are in amounts sufficient to be unsightly or deleterious.

  (C) Produce: (i) color; (ii) visible oil sheen; (iii) odor; or (iv) other conditions; in such degree as to create a nuisance.

  (D) Are in concentrations or combinations that will cause or contribute to the growth of aquatic plants or algae to such degree as to: (i) create a nuisance; (ii) be unsightly; or (iii) otherwise impair the designated uses.

Current Phosphorus Removal Requirements for Point Sources

- Phosphorus removal required for:
  - Daily discharge of 10 lbs. or more AND
  - Discharge located within Lake Michigan or Lake Erie OR
  - Discharge directly enters a lake or reservoir or enters a tributary within 40 miles upstream of a lake or reservoir OR
  - Determination by Commissioner

Nutrient Impairments in Indiana Lakes

- Currently, 50 natural lakes on 303(d) list of impaired waters for total phosphorus (TP)
  - Represents 44 % of all assessed natural lakes
  - TP is the primary cause of impairments in these lakes
- Nutrient impairments assessed based on TP and chlorophyll *a* (chl *a*) benchmarks

Proposed Rulemaking

- Adopt new eutrophication criteria for natural lakes and reservoirs
  - Include both TP as the causal variable measurement and chl *a* as the response variable measurement

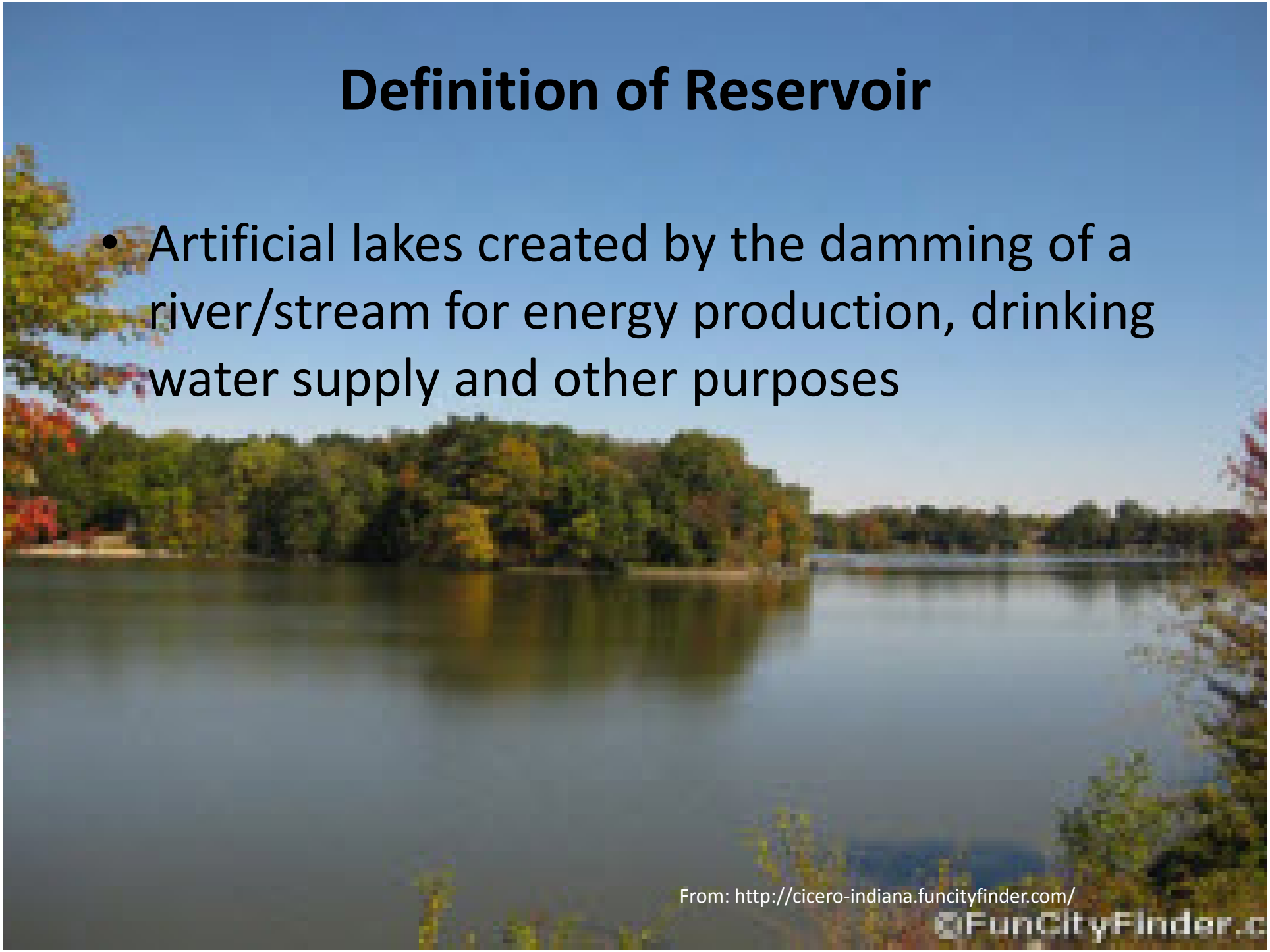
Definition of Natural Lake

- Glacial lakes (formed by glacial activity)
- Oxbow lakes (formed from meandering river channels)
- Solution lakes (formed when solution of limestone found in regions of karst topography collect in basins)

From http://www.vinceweirick.com/lakes.shtml

Definition of Reservoir

- Artificial lakes created by the damming of a river/stream for energy production, drinking water supply and other purposes



Future Topics

- Development of TP and chl *a* criteria for lakes and reservoirs
- Methodology for assessing nutrient impairments in lakes and reservoirs
- Determining permit limits for direct and indirect discharges

Questions?

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